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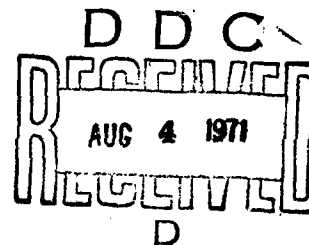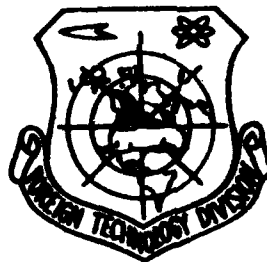# FOREIGN TECHNOLOGY DIVISION

THE DEVELOPMENT OF A DESCRIPTOR-TYPE IR SYSTEM
FOR THE ABSTRACT JOURNAL "PIPELINE TRANSPORT"

by

R. P. Palatova
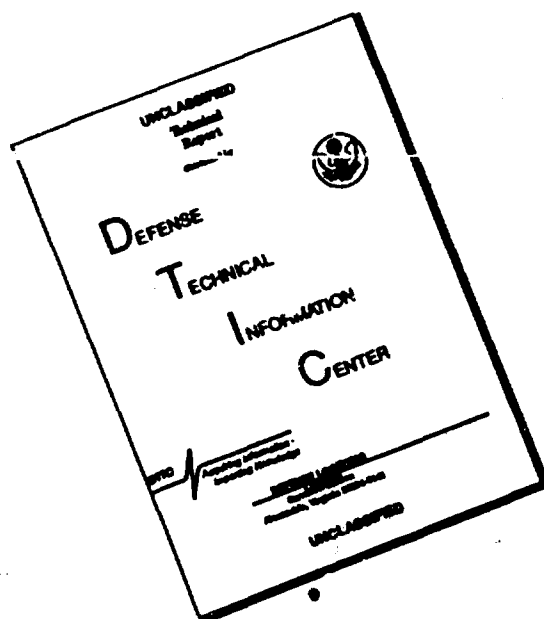
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THE DEVELOPMENT OF A DESCRIPTOR-TYPE IR SYSTEM
FOR THE ABSTRACT JOURNAL "PIPELINE TRANSPORT"

By: R. P. Palatova.

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Date 25 May 1971

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А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

* ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yё or ё.
The use of diacritical marks is preferred, but such marks
may be omitted when expediency dictates.

Translator's note: On several occasions, symbols
found in formulae and calculations appear to have
been rendered incorrectly in the original document.
They will be shown exactly as they appear in
the original.

THE DEVELOPMENT OF A DESCRIPTOR-TYPE IR SYSTEM
FOR THE ABSTRACT JOURNAL "PILELINE TRANSPORT"

R. P. Palatova

For the systematic acquaintance of readers with worldwide
scientific and technical literature in the area of pipeline transport,
VINITI [All-Union Institute of Scientific and Technical Information]
since 1962 has published the abstract journal "Pipeline Transport"
[RZhT] (PЖT). In it there are published abstracts, annotations, and
bibliographical descriptions for articles from 100 periodical and
continuing journals which are published in 25 countries in 20 languages.
The RZhT refers also to patents, standards, and books issued in the
USSR and abroad.

The growth of information on pipeline transport has caused a
systematic increase in the volume of RZhT with 28 author lists in
1962 to 77 author lists in 1968. For this period the total volume of
the RZhT amounted to 288 author lists while more than 15 thousand
information materials were published.

In connection with this there occurred the need for creating an
IR system [IRS] (ИПC) which would allow us to retrieve the necessary
publications rapidly exhaustively, and multiaspectively.

In 1966 the editorial staff of RZhT began the development of a
descriptor-type IRS.

The developers of this system face the following problems:

1. To guarantee the retrospective retrieval of literature at the inquiries of the users. The retrieval array should include all abstracts printed in RZhT beginning with 1962.

2. To organize the regular reference-information service of individual and collective "subscribing" consumers of information so that they may be informed monthly about the received material on their subjects of interest.

Such a system will free subscribers from the need of continuously examining the RZhT at the moment the next issue is published, they will already have a list of the abstracts they are interested in.

3. With the aid of the IRS to guarantee the mechanized preparation of the subject index for the annual assembly the RZhT and its publication no later than 2 weeks after the distribution of the 12th (December) issue of the periodical.

4. To guarantee a mechanized preparation of author index for the annual assembly of the RZhT[1].

Special attention was given to the development of the information-retrieval language [IRL] (ИПЯ).

More than 50 supernumerary, highly skilled specialists - the readers of RZhT — are drawn to this work.

The readers were charged with a free indexing of the documents which the abstracts were constituted. The latter consists of

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[1]At the present time the author index for the RZhT is not issued. In this case the author index is assumed to be received as a "side product" of the IRS.

describing the paper content by a list of the key words (k. w.), which are most suitable to the subject indexer for this purpose. In this case it is not absolutely mandatory that the key words be in the test of the abstract. This key-word method is also the search pattern of the abstract.

The best quality of indexing can be especially guaranteed by the reader, since he sees the original of the document and is highly specialized in a specific area. Such a method is also the most "rapid," since the editorial staff receives abstracts with prepared search patterns.

Beginning with the first issue of 1967, each abstract in the RZhT is furnished with a set of key words (Fig. 1).

In the process of creating the IRL an individual card was set up for each key word. The cards were entered with all numbers of the abstracts whose search pattern included this key word. The cards were alphabetized.

The 12th (December) issue of RZhT for 1967 had "An Index of Key Words for 1967." In this index the key words are alphabetized and , are accompanied by the numbers of all abstracts whose search patterns they made up (Fig. 2).

This index is an IRS for individual use. Using the index, the reader can organize an inverted IRS on any carriers of information.

The organization of the circulation of the contents of 3У... * (of both document and inverted modes) on punched cards by either manual or machine sorting also presents no difficulties.

Key words accumulated as a result of the free indexing of 2180 abstracts printed in 12 editions of RZhT for 1967 served as the basis for constructing the descriptor dictionary.

*[Translator's Note: 3У = ZU = memory unit].

УДК 621.643.411.4

2.45.79 П. *Apparatus for welding thin-walled pipes.* Rohrberg Roderick, G. Armitage, Earl Stanley. Welding Apparatus. [North American Aviation, Inc]. U. S. Patent., Class 219-60, No. 3238347, announced 26 October 1964, published 1 March 1966.

Key words: Patents, Pipes, Thin-walled, Welding, Electric-arc. Precision.

A welding apparatus intended for precision electric-arc welding of thin-walled pipes has been patented. The small sizes of the apparatus and its compactness allow welding under conditions of limited space. The apparatus provides the possibility of supplying an inert gas for creating a protective medium in the welding zone 16 Illus.

УДК 621.643.002.2

2.45.80. *The utilization of elastic linings in the construction of pipelines.* - Cushion cradle supports pipe in rocky terrain. "Pipe Line Ind." 1966, 25, No. 2, 50 (Eng.).

Key words: Pipelines. Building. In rock soils. Foam-plastic linings.

The experiment of using elastic linings made of styrene foam in padding the pipeline with a diameter of 36" in rock soils is generalized. The linings were placed in a trench in a section 40 km long. The elastic foam-styrene linings had the dimensions of $200 \times 400 \times 900$ mm and withstood a reference pressure from 1.4 to 2.1 kg/cm^2. In rock soils the bottom of the trench should be filled up with a layer of sand no less than 15 cm thick. The delivery of the sand causes considerable additional losses. The utilization of plastic linings in this instance can be circumvented by a cheaper method. During the tests the foam-styrene linings were not destroyed with the shift of the heavy pipeline runners over them for small distances.

Fig. 1. A fragment of the Abstract Journal Pipeline Transport for 1967 No. 2.

ИРАИ, 2.45.17, 3.45.19, 7.45.9, 7.45.13 10.45.20
ИСПАНИЯ, 4.45.11, 4.45.7
ИСПАРЕНИЕ, 2.45.176, 2.45.179, 3.45.122, 3.45.173
3.45.174, 4.45.180, 5.45.161, 6.45.161 7.45.160
7.45.170, 9.45.120, 11.45.193
ИСПЫТАНИЯ, 1.45.17, 1.45.73, 1.45.75, 1.45.130,
1.45.131, 2.45.51, 2.45.79, 2.45.71, 2.45.133, 2.45.134,
2.45.142, 2.45.154, 3.45.136, 4.45.19, 4.45.35, 4.45.69,
5.45.34, 5.45.77, 6.45.75, 6.45.117, 6.45.127, 6.45.128,
7.45.38, 7.45.170, 8.45.40, 8.45.49, 9.45.60, 9.45.94,
9.45.117, 9.45.145, 10.45.180, 11.45.65, 11.45.154,
12.45.117, 12.45.118
ИСТОЩЕННЫЕ МЕСТОРОЖДЕНИЯ, 5.45.174, 6.45.178.
ИТАЛИЯ, 6.45.7, 7.45.13, 6.45.7 8.45.10, 10.45.9,
11.45.7, 11.45.20, 12.45.3
КАБЕЛИ СВЯЗИ, 2.45.66, 5.45.74 12.45.74 12.45.129
КАДРЫ, 4.45.137
КАЛИБРОВКА, 4.45.169
КАМЕННОУГОЛЬНЫЕ, 1.45.62, 7.45.144, 7.45.156,
10.45.104
КАНАВА, 1.45.12, 1.45.54, 2.45.12, 2.45.13, 3.45.16,
3.45.17, 4.45.21, 4.45.22, 6.45.23, 6.45.124, 6.45.175,
7.45.24, 7.45.25, 7.45.26, 8.45.6, 8.45.24, 8.45.25,
8.45.27, 8.45.28, 8.45.29, 8.45.30, 8.45.31, 8.45.32,
8.45.33, 8.45.94, 8.45.96, 9.45.22, 9.45.23, 9.45.90,
9.45.138, 9.45.147, 10.45.9, 10.45.25, 11.45.17,
11.45.18, 12.45.20, 12.45.21, 12.45.22, 12.45.23
КАНАЛИЗАЦИОННЫЕ, 1.45.61, 2.45.30, 3.45.88,
6.45.16, 7.45.129, 10.45.126
КАПЛЕВИДНЫЕ, 5.45.122
КАТОДНАЯ, 1.45.152, 1.45.153, 2.45.62, 2.45.135,
2.45.140, 2.45.141, 2.45.142, 3.45.130, 3.45.160,
4.45.147, 4.45.148, 4.45.149, 4.45.150, 4.45.152,
4.45.154, 4.45.155, 4.45.157, 5.45.140, 5.45.145,
5.45.146, 6.45.145, 6.45.146, 7.45.145, 7.45.150,
7.45.151, 7.45.152, 7.45.153, 8.45.133, 8.45.134,
8.45.135, 8.45.138, 8.45.139, 9.45.111, 10.45.137,
10.45.140, 10.45.148, 10.45.149, 10.45.150, 10.45.151.

Fig. 2. A fragment of the index.

The frequency of the use of key words in the search patterns
of abstracts and their proposed significance served as the criterion
of selecting them as descriptors. The actual inquiries received by
the editorial staff from the readers of RZhT were also taken into
account.

The array of descriptors received on cards was subjected
to lexicographic treatment.

Nouns and adjectives, if this was expedient, were used in the
plural. Synonymy was liquidated. For this, of every group of
synonymous descriptors there is singled-out "working" descriptor, which
in the future should also be used in the search patterns of the
abstracts; the remaining synonymous descriptors are provided with a
reference [Translators Note: Exact translation of отсылка could
not be found in available sources. Assumed as shown here] (see
the example below) to the "working" descriptor.

5

The "working" descriptors obtained a code. The code is a three-digit literal code. The first two letters of the code coincide with the first two letters of descriptor and any letter of the descriptor can in principle be accepted as the third letter of the code. Such a code, in comparison with the digital code, is clearer, and it is easily remembered, and monitored.

The dictionary of the descriptors was printed from the descriptor cards arranged in alphabetical order. A fragment of the dictionary (the descriptor code is shown from the left) is shown below.

АВА	Emergencies
АВУ	Emergency equipment
АВЛ	Australia
АВС	Austria
АВТ	Automation
	Author's certificates, see Patents
АГР	Aggressive products
А30	Nitrogen

In compiling the descriptor dictionary the developers hold to solve a number of problems. One of them was as follows. Certain key words made up a large amount of the search patterns, so that in "Key-word Index for 1967" the list of the abstracts was practically boundless. In connection with this measures were taken for "unloading" such key words. For example, the key word "capacities" took in 12% of all issues of abstracts; the solution was introduced into three descriptors into the dictionary instead of that key word: "Gas tanks," "Reservoirs," and "Cisterns." For another example the key word "Construction" yielded 17% of all issues of abstracts; the solution was to substitute it by the descriptors: "the Construction of gas storage tanks," "the Construction of cable lines," "the Construction of oil-tanks" and "the Construction of pipelines."

At the present time the dictionary numbers 568 descriptors. It is assumed that from 1969 all readers will use the descriptor dictionary in compiling the search pattern of the abstracts.

A technical colleague of the editorial staff, using the descriptor dictionary, edits the search patterns compiled by the readers. In the absence of a conditionally equivalent descriptor the colleague will introduce a key word into the card index of undefined key words and leave it in the search pattern of the abstract.

It should be noted that, the editing of search patterns can apparently be automated.

To provide completeness in the distribution of information there has been provided the possibility of adding the inquiry search patterns by descriptors which are located in gender-type and associative relationships with the inquiry descriptors. For this purpose in RZhT there has been developed a thesaurus in which the descriptors are associated by gender-type and associative relationships.

The thesaurus has been realized in the form of a card index. Every descriptor is registered on an individual card, on which the synonymous, associative, type and gender descriptors are shown as well as the code. Thus, for the descriptor "Reservoirs" the following descriptors associated with it in meaning are defined: "Gas tanks," "Cisterns," "Reservoir covers," "Level limiters," "Pontoons," "Foundations of reservoirs," and "Oil-tanks." All cards with descriptors are alphabetized in the thesarus.

A component part of the thesarus is the card index of undefined key words, which can be used in the search patterns of the abstracts. Henceforth, depending on the frequency of use, the undefined key words should either become descriptors or should be removed from the card index.

Since the subject and author indexes for the RZhT will be
compiled based on the IRS, the most advisable organization scheme
of the active memory of the IRS is a document scheme in which
one punched card is registered for each abstract.

To us it is expedient to show the language and type of the
original and also the type of the second publication of the abstract
journal in the subject entry of the subject index and during answers
to inquiries.

The following mock-ups a 80-column punched card has been
developed:

1-5	6-7	8-12	13	14	15-17	18-44	45-80
For servicing purposes	Year of publication of abstract journal	The number of abstract	Type of the original	Type of secondary publication	Language of original	Descriptors	Author

Two digits corresponding to the last two digits of the year of
publication of the abstract journal are punched in 6-7 columns.

The number of the abstract consists of five digits; the first
two digits indicate the number of the periodical, and the last
three digits indicate the number of abstract within the given issue
of the periodical.

A journalistic article is designated by letter Ж; a book by –
К, a patent or author's certificate by П, a standard by С, a disser-
tation by Д, and a review by Р.

The type of the secondary publication is coded in line manner: bibliographic description by Б, annotation by A, and abstract by P.

The language is coded by three letters, for example: English [ANG] (АНГ), Bulgarian [BOL] (БОЛ), Italian [ITA] (ИТА), German [NEM] (НЕМ), the Russian [RUS] (РУС), etc.

Since as the search pattern of the abstract contains from 2 to 9 descriptors, 27 columns are allocated under descriptors on the punched card.

*   *   *

From the above it is possible to draw the following conclusion:

1. There has been created an information-retrieval language to the IRS for the abstract periodical "Pipeline transport" and a descriptor dictionary and thesaurus have been developed. Under the conditions of VINITI the empirical method of creating an IRS using the work of readers not on the staff was effective. This method has the following advantages:

a) the editorial staff receives abstracts already having search patterns;

b) the best quality of subject-indexing is assured, since it is done by highly skilled specialists in every narrow subject area;

c) the time spent on subject-indexing is saved; a reader becomes acquainted with the original content during abstracting;

d) the quality of the paper is raised: because of subject-indexing, the reader is given a clearer picture, on what to accentuate his attention in the abstract, and what may be excluded from the test of the abstract.

2. A mock-up of the punched card and the code system have been developed.

3. A cumulative "Key-word-index" which is an inverted IRS of individual use is published for the annual assembly RZhT.

Subsequent stages in the creation of the IRS will consist of the development of algorithms and a program of machine retrieval (including the compiling of the subject and author indexes) and in the experimental development of the IRS.

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13. ABSTRACT

An IR system is described, currently under development in the Transport Department of the VINITI. The system will provide for retrospective literature searching, selective information dissemination, and mechanized compilation of subject and author indexes to the annual volume of the Abstract Journal of Pipeline Transport. The development procedure, the 80-column punch card layout, and the coding system are described. Orig. art. has 1 illustration. [AR0010882]

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
IR System Automation						